ATOMIC ENERGY newsletter

THE FIRST AND ONLY

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Dear Sir:

Lending assistance in the forthcoming British tests of nuclear weapons at the Woomera rocket range in Australia will be two U.S. Air Force B-29 aircraft. The craft will help monitor upper air regions, after the detonations occur; the work will be in the nature of routine meteorological test work. They came to Australia at the invitation of the Commonwealth Government, in the direction of frank exchange of information between the United States and the British Commonwealth within the limits imposed by the Atomic Secrets Act. (Prime Minister Robert G. Menzies, of Australia, recently urged the fullest possible interchange of information between the United States and the British Commonwealth. He deplored the duplication of work, and the loss of time, effort and money, which lack of such an information exchange engenders.)

Executive manager of the Atomic Industrial Forum, Inc., is now Charles E. Robbins. His appointment to this position was announced last week by Walker L. Cisler, president of the Forum. Mr. Cisler at the same time announced the appointment of Oliver Townsend, formerly assistant to the chairman of the USAEC, as assistant executive manager and secretary of the forum. The Forum, an association of businessmen, and educators, was incorporated last April to encourage the development and utilization of atomic energy by all phases of industry; to provide a mechanism through which problems relating to atomic energy development might be resolved; and to foster nuclear research and development. (Mr. Townsend has just been appointed to the Advisory Committee on Industrial Information of the USAEC. The Committee advises the USAEC on industry's needs for atomic energy information, and "assists" the Commission by identifying that information which should be released for publication and widely disseminated on a non-secret basis.) Firms with representatives on the board of directors of the Forum include: Detroit Edison Co.; B.F. Goodrich Co.; Babcock & Wilcox Co.; National Lead Co.; Nuclear Development Associates, Inc.; General Electric Co.; Foster-Wheeler Corp.; Dow Chemical Co.; Phillips Petroleum Co.; Standard Oil Co. of Calif.; Newport News Shipbuilding & Drydock Co.; and Bechtel Corp. Educational institutions so represented include: Purdue University, and Case Institute of Technology.

The USAEC has reached a decision on whether industry may more fully utilize results of work done by the USAEC, Lewis L. Strauss, Chairman, USAEC, told the National Security Industrial Association, meeting in New York last week. But the answer, he said, cannot be revealed at this time, and will not be made public until the recommendation is submitted to Congress next January.

New executive vice president of Vitro Corp. of America is George White, Jr. who since 1946 has served in various capacities with Vitro Manufacturing Co., and Vitro Chemical Co. (Vitro Manufacturing Co. is a processor of uranium-bearing materials; Vitro Corp. of America, largest subsidiary, does nuclear engineering, and development of processing and manufacturing plants. Another subsidiary, Vitro Chemical Co., processes uranium-bearing ores on the Colorado Plateau.)

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BUSINESS NEWS...in the nuclear energy field...

PROGRAM OUTLINED FOR INDUSTRIAL NUCLEAR POWER: Concrete suggestions for an industrial nuclear power program in the United States, were made by George L. Weil, Washington, D.C. nuclear consultant, before an audience at the nuclear engineering conference held at the University of Calif., last month. To get a power program going, Dr. Weil said that power-only plants, built and operated on the basis of present technology, should be the first step. Then he said, development of "second generation" plants should be started. And, thirdly, long range development of reactors, with high breeding factors and high specific power, should be started. These would be the objectives of a single-purpose program directed toward production of civilian nuclear power alone, he noted. He observed that so far as the U. S. is concerned, a delay of 10-years in starting such an active, single-purpose program, directed toward civilian power only, would not be too serious. However, he stated, other countries are not so well off, energy-wise, and short-term development on our part, using present knowledge, could be of assistance to them. Unless this opportunity is seized (by the U.S.) other countries will (and are now doing so) forge ahead. Dr. Weil went over the various proposals others have made for civilian nuclear power development: some believe that first construction should be a government burden; others think that relaxation of legislative restrictions will induce industry to move ahead alone; and still other groups advise against hasty and ill-considered action.

Dr. Weil pointed out that despite the USAEC's specific authorization for developing industrial power, it does not appear to have, at present, a program directed toward single-purpose power plants, which would produce power alone without being coupled with plans for producing fissionable material for weapons. Nor, he said, does the USAEC seem to have such a plan for the future. He concluded that, from industry statements, it does not seem likely that industry would go ahead even if present legislative restrictions were removed.

Discussing current nuclear reactor technology, Dr. Weil said that too much emphasis is being placed on breeder reactors, to the point where breeding has become symbolic of a quick and relatively easy solution. Since breeding is but one aspect of reactor technology, this is oversimplifying the problem, he stated. Undoubtedly the reactor of choice in the future will be one with a high breeding factor, he pointed out, but meanwhile breeders and nonbreeders should be used. The evolution that will take place, he predicted, will be a gradual improvement in reactor operation from poor nonbreeders through good non-breeders, and poor breeders to units with high breeding characteristics. It is at this latter stage, he observed, that nuclear energy would account for a large part of the U. S.'s energy sources.

NUCLEAR ENERGY PROGRAM IN U.S. DEFENDED: Defending the USAEC's plan for nuclear power development against criticisms of it as an "atomic give-away program", and against unfavorable speeches by some members of Congress, William L. Davidson, director of the USAEC's office of industrial development, told a meeting in New York last fortnight that the USAEC will not subsidize particular private nuclear power projects so as to take the risk out of private investment in this area. Dr. Davidson, who was addressing the National Association of Railway and Utility Commissioners, said the USAEC never had expressed any intention of disposing to private industry those production plants and facilities and reactors that had been and were being built at public expense. He suggested that nuclear "know-how" be made available, within limitations of national security, to industrial teams willing to finance their own research. This would prevent concerns now doing work under USAEC-administered contracts from having a monopoly of nuclear energy techniques and skills.

PRODUCT NEWS...in the nuclear field...

Recently introduced by Radioactive Products, Inc., Detroit manufacturer of nuclear devices, is a new line of fast neutron proportional counters. These counters are said to handle a wide range of neutron flux measurements around reactors, accelerators, and neutron sources. They will detect neutrons exclusively in fields of several roentgen of gamma radiation.

New catalogue of Technical Operations, Inc., Arlington, Mass., producer of nuclear instruments and accessories, shows this firm's devices, services and training programs in the nuclear field.

NUCLEAR WORK ABROAD...

Great Britain: The technical feasibility of nuclear fueled power plants is now an established fact, B. L. Goodlet recently told the British Association for the Advancement of Science, at its recent annual meeting in Liverpool. Mr. Goodlet is deputy chief engineer of the Atomic Energy Research Establishment, Harwell. An improved type of natural uranium reactor has been designed at Harwell, Mr. Goodlet stated. It is enclosed in a pressure shell, the heat being transferred by gas under pressure through a heat exchanger to a steam-turbo alternator. The design output and over-all thermal efficiency of this plant are satisfactory, he observed, and it is now being built. Mr. Goodlet estimated that, assuming no by-product revenue, the cost of electricity generated by this plant would be about 1.2 cents per kilowatt-hour.

Britain's interest in economic nuclear power, Mr. Goodlet stated, is due to several factors: (1) National demand for electricity in Britain seems likely soon to outstrip the national output of coal, (2) The economics of nuclear power may become more favorable as coal prices rise, and (3) The per capita consumption of coal in Britain is the highest in the world, approximating four tons per year.

To replace the coal now being burned by the national power stations in Britain, Mr. Goodlet estimated that some 4000 tons of natural uranium would be needed per year. He based this estimate on the assumption that not more than half the energy of the uranium-235 could be economically extracted in a natural uranium reactor. Mr. Goodlet showed calculations for both the natural uranium power plant, and a breeder reactor. It was his opinion that a natural uranium power plant can be economic at a capital cost of two to three times that of a conventional plant, provided that rates of interest, redemption, and maintenance are the same.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Experimental Nuclear Physics, edited by E. Segre. Second volume, of a three-volume work. As in the first book, volume II consists of individual sections by authorities in their field. A survey of nuclear reactions is provided by Philip Morrison, Cornell University, while the second part of this new work is a study of the neutron, contributed by Bernard J. Feld, M.I.T. (Overall objectives of the work are to bring the worker up-to-date in experimental techniques, to point out the significant facts and data in the field, and to indicate the broad lines of theoretical interpretation.) 600 pages.--John Wiley & Sons, Inc., New York 16, N.Y. ($12.00)

Laboratory Experiments With Radioisotopes for High School Science Demonstrations. Designed to assist high school science teachers in setting up radioisotope experiments, this booklet evolved from the in-service training course given New York City high school science teachers in the Spring, 1952, by the City's Board of Education, assisted by the USAEC. Staff members of the USAEC's New York Operations office, who worked with school officials in drawing up the experiments, were Dr. John H. Harley, Mrs. Evelyn Jetter, Hugo J. DiGiovanni, and Hanson Blatz.--Sup't. of Documents, Wash. 25, D.C. (25¢)

Major Activities in Atomic Energy Program, Jan.-June, 1953. This is the 14th semi-annual report of the U.S. Atomic Energy Commission. 98 pages..--Sup't. of Documents, Wash. 25, D.C. (30¢).

PEOPLE...in the nuclear energy program...

W. J. Bennett, president of Eldorado Mining & Refining, Ltd., Canadian-government owned uranium producer, has been elected president of Atomic Energy of Canada, Ltd. He replaces Dr. C.J. MacKenzie, who is resigning from Atomic Energy of Canada, Ltd., the government organization controlling atomic energy in Canada.

Kenneth D. Nichols will become the general manager of the USAEC November 1st, with the resignation of Marion W. Boyer, who has held that post for three years. Nichols, former Major General, is a career army officer who in 1942 became associated with early U.S. nuclear energy plant construction in this country. (Criticism has been leveled at this appointment on the grounds that the Atomic Energy Act (1946) was expressly designed to prevent military and naval officers from molding policy in this field.)

Dr. Leo Szilard, physicist who contributed importantly (at Columbia University) to the development of the atomic bomb in the U.S., has now been appointed professor of biophysics at Brandeis University, Waltham, Mass.

RAW MATERIALS...radioactive minerals for nuclear energy utilization...

UNITED STATES: The guaranteed minimum prices paid by the USAEC for uranium ores from the Colorado Plateau area, as well as the initial production bonus, have now been extended. One part of this original program, as extended, went into effect March 1, 1951 and covered through March 31st, 1958; this latest ruling extends it through March 31st, 1962. It provides guaranteed minimum base prices for the uranium oxide content of carnotite-type and roscoelite-type ores of the Colorado Plateau. These prices range from $1.50 to $3.50 per pound of uranium oxide content, depending upon the grade of the ore, together with certain allowances and premiums. Another part of this program established a bonus for initial and certain other production of uranium ores from domestic mines delivered under its terms between March 1, 1951, and February 28, 1954; this has been extended through February 28, 1957. (Bonus payments, which are adding substantially to revenues of uranium ore producers, range from $1.50 to $3.50 per pound of uranium oxide in acceptable ores produced from eligible mining properties, depending on the grade of the ore. Thus, the maximum bonus which may be obtained from production of new mines ranges from $15,000 to $35,000, depending upon the grade of ore delivered.)

CANADA: A new area in the Sudbury-Saulte Ste. Marie district has attracted attention, following radioactive finds made here. The area is east of the Blind River district, and about 12-miles north of Espanola, in Parker, Hyman, Shakespeare and Baldwin Townships. Already several hundred claims have been staked in the area. Among those who have staked claims in the area is Noranda Mines, with two groups, as well as one further north in the vicinity of Hunter Lake.....A radioactive area of interest was recently discovered in the northwest corner of Saskatchewan, west of Sheppard Lake, it has now been reported. The area is said to be geologically and structurally of interest. Chemical assays on grab samples were said to have shown 0.42% uranium oxide, while a radiometric assay on a subsequent assay is said to have given 1.13% uranium oxide equivalent.

AUSTRALIA: A new schedule of prices for uranium bearing ores and concentrate has now been issued by the Australian Atomic Energy Commission. The prices range from £10 a ton for ore with a uranium content of 0.25% to £504 a ton for 10% ore. These prices would be equivalent to $4.48 a lb. for uranium oxide in a 0.25% ore and $5.64 a lb. for uranium oxide in a 10% ore. (Prices in the United States carry special bonuses and allowances. In Canada the maximum price is $7.25 per lb., but to be salable the ore must be offered to the government in a form carrying 10% or more uranium oxide. The maximum price paid (in Canada) is when the mine grade of the ore is 0.25% or less. If the average mine grade is more than 0.25%, the price paid for the uranium oxide is scaled down. In Canada, too, development allowances increase the basic buying prices.)

AT SCIENTIFIC MEETINGS...papers on nuclear energy subjects...

An inexpensive, accurate, mobile, and rapid method of monitoring a nuclear reactor was described at the recent annual meeting of the American Chemical Society, in Chicago, by Sheffield Gordon, Argonne National Laboratory. The unit is based on the fact that water decomposes into hydrogen and oxygen when subjected to radiation. The volume of gases evolved had been calibrated to show integrated gamma and thermal neutron fluxes. First, he said, a potassium iodide solution was exposed to neutron and gamma-ray bombardment in Argonne's CP-3 atomic pile, and the rate of gas evolution measured. An identical solution was then irradiated by a standard cobalt-60 source to calibrate the unit for gamma and neutron radiation. Second step was to add boric acid to the potassium iodide solution. Boron selectively absorbed neutrons, and the lithium recoils decomposed water into hydrogen and hydrogen peroxide, the latter further decomposing into oxygen and water. By subtracting the gas evolution rate obtained in the first step, from that in the second, the intensity of the neutron beam was determined. Purpose of the potassium iodide is to prevent gamma radiation from causing recombination of hydrogen and hydrogen peroxide. Dr. Gordon also observed that in addition to being quick and accurate, the method is superior to foil activation because the solutions do not become highly radioactive.

ATOMIC PATENT DIGEST...recent U.S. grants...

Apparatus for measuring the level of a liquid in a container. A pair of high frequency resonant circuits with different resonant frequencies are partially immersed in the liquid. The resonant frequency of each of these circuits is dependent on the liquid level. Means are provided for generating a high frequency electrical signal, and for applying this signal to both of these circuits. Frequency discriminator means connected to these circuits permit an error signal to de derived corresponding to the difference between the frequency of this high frequency signal and the mean resonant frequency of these circuits. U. S. Pat. No. 2,651,940 issued Sept. 15th, 1953; assigned to United States of America (USAEC). (Inventor: Kenneth H. Kline.)

Automatic tank pump down. A system for evacuating a tank, comprising (in part) a mechanical pump and several diffusion pumps, with these pumps connected to the chamber through valves, as well as connected to each other. Relief valves, actuated at certain pre-set pressures, first connect the mechanical pump to the chamber; lower pressures connect the diffusion pumps in series with it to evacuate the chamber to a higher vacuum. U. S. Pat. No. 2,652,188 issued Sept. 15th, 1953; assigned to United States of America (USAEC). (Inventor: Rob Roy Cyr.)

Device for utilizing radioactivity for logging a borehole traversing subsurface formations, and containing a fluid. Comprises (in part) an elongated instrument housing adapted to be passed through the hole, and a cable supporting the housing. A source of primary radiation, and a detector of secondary radiation, are in the lower portion of this housing. A flexible impervious sheath is attached to the housing near its upper end, and surrounding the lower portion of the housing, with a quantity of fluid-like substance in this sheath, this substance being substantially non-hydrogeneous and having a low capture cross section for slow neutrons. U. S. Pat. No. 2,652,496 issued Sept. 15, 1953; assigned to The Texas Company, New York, N.Y. (Inventors: Gerhard Herzog and Alexander S. McKay.)

Apparatus for measuring temperature. Comprises (in part) a radioactive gas enclosed in a permeable container for exposure to the temperature to be measured, means for collecting that portion of the gas which diffuses through the walls of the container, and means for determining the rate of diffusion of the gas. The temperature is then indicated by the intensity of radiation of the diffused gas. U. S. Pat. No. 2,652,497 issued Sept. 15, 1953; assigned to United States of America (USAEC). (Inventor: Arthur J. Miller.)

Device for optically detecting alpha radiation from a radioactive sample. Comprises (in part) a housing with its two ends open, a sheet of transparent material at the detecting end with a layer of phosphor substance on this material, and facing the detecting end, and a layer of virtually transparent light-refracting particles on the surface of the sheet facing the viewing end. Two lenses are interposed between the transparent sheet, and the viewing end. U. S. Pat. No. 2,652,499 issued Sept. 15, 1953; assigned to Pacific Transducer Corp., Los Angeles, Calif. (Inventor: George A. Argabrite.)

Gas discharge device. A voltage regulator tube, including within a hermetically sealed envelope containing an ionizable gas, an anode and a cathode, the cathode having an effective area no greater than that of the glow which the tube must support at maximum rated current. U. S. Pat. No. 2,652,510 issued Sept. 15, 1953; assigned to United States of America (USAEC). (Inventors: Leo Raymond Landrey and Alred Mazzei.)

Method of radioactively priming a resonant window for high-frequency discharge devices. Comprises the steps of depositing a thin film of metallic oxides on the apertured metallic frame member (of this window) positioning a dielectric enclosure member on it, depositing several drops of an aqueous radioactive solution having a concentration of approximately 5 microcuries per cc. on this positioned dielectric enclosure member, and heating the positioned members to the temperature necessary to fuse the dielectric material and metallic oxides in a vacuum tight seal. U. S. Pat. No. 2,652,618 issued Sept. 22, 1953; assigned to Bomac Laboratories, Inc., Beverly, Mass. (Inventor: Thomas G. Prescott.)

Sincerely,

The Staff,
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